



SUBJECT DATASHEET

Semester:	2009/10/2
Subject:	Product Design
Code:	VEMKTEV243T
Responsible department:	Department of Hydrocarbon and Coal Processing
Responsible department code:	MKOL
Responsible lecturer:	Dr. Jenő Hancsók

Educational objectives:

Learning the aspects of the design and manufacture of chemical products

Detailed content of the subject:

1. Role of chemical product design in the chemical industry and chemical engineering education (definition of chemical product design and its importance) 2. Procedure of chemical product design (demands, possibilities, selection, manufacture, quality control, etc.) 3. Concrete, numerical definition of the arising demands (surveying of consumer demands and conceptualization) and characteristics (milestone I) 4. Possibilities (preliminary conception, from the basic idea to the industrial product, sources of ideas: literature including patents, developers, conceptions of the main consumers, third party experts) 5. Possibilities of problem-handling, searching for chemical ideas; random structural discovery, combinatorial chemistry) 6. Categorization of ideas and pre-evaluation; screening aspects: availability of scientific knowledge, engineering aspects, lowest risk; low costs, safety, lowest pollution of the environment (Milestone II.) 7. Selection, necessity of a screening matrix 8. Objective aspects of the screening (thermodynamics, kinetics material and heat balance, mass and heat transport); less objective aspects (brand new product or a developed one); subjective aspects 9. Risks during the selection of a products, risk comparison among the possible products; risk management (Milestone III.) 10. Manufacture of the product (intellectual property law: patents. application for a patent, etc.) 11. Collection of supplementary information (reaction pathways, etc.); final characteristics (product structure: chemical composition, sizes, reactions, thermodynamic properties of the product) main product characteristics: structure stability flexibility, pH, heat transfer, diffusion, etc. 12. Production of specialty products 13. Unit operations 14. Manufacturing equipments 15. Economical aspects (Milestone IV.)

Requirements:

Product design challenge. Total: 90 hour: • Contact time: 45 hour • Self preparation: 20 hour. • Presentation: 25 hour.

Required and suggested references:

Cussler, E. L.; Moggridge, G. D.: "Chemical Product Design" Cambridge University Press, 2001. Ulrich, K. T., and S. D. Eppinger, Product Design and Development, Second Edition, McGraw-Hill, 2000. Moggridge, G. D.;



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Cussler, E. L.: "An Introduction to Chemical Product Design", Trans IChemE 2000, 78, 5-11. Weissermel, K., Arpe, H.J.: Ipari szerves kémia, Nemzeti Tankönyvkiadó, Budapest, 2003.